(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
1 March 2001 (01.03.2001)

PCT

(10) International Publication Number
WO 01/15443 A1

(51) International Patent Classification[7]: H04N 7/01, 7/173, 7/16, 7/18, 5/445

(21) International Application Number: PCT/US00/20387

(22) International Filing Date: 27 July 2000 (27.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/377,780 20 August 1999 (20.08.1999) US

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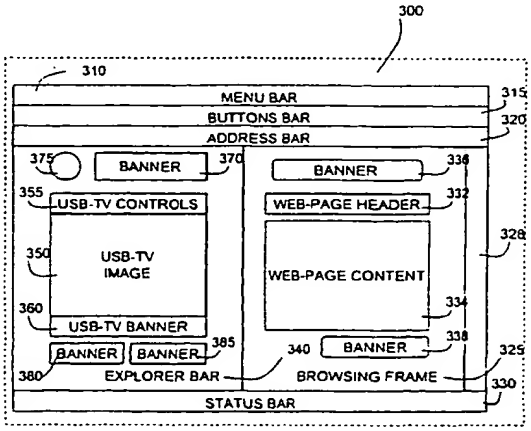
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*
— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DEVICE, SYSTEM AND METHOD FOR USB TELEVISION AND TELEVISION INTEGRATION WITH ADVERTISING AND WITH INTERNET BROWSING



(57) Abstract: A device, a method and a system for enabling television program content to be displayed through a computer. Furthermore, the present invention enables the user to select, record, display and manipulate television program content through the computer. In addition, the present invention enables the user to view television programs while examining data resources through the Internet, such as Web sites for example. A GUI (graphical user interface) is preferably presented to the user through a Web browser (300). Thus, the present invention enables two popular, entertaining activities, watching television programs and examining Web sites, to be combined, while maintaining targeted advertising.

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DEVICE, SYSTEM AND METHOD FOR USB TELEVISION AND TELEVISION INTEGRATION WITH ADVERTISING AND WITH INTERNET BROWSING

FIELD AND BACKGROUND OF THE INVENTION

The present invention relates to a device, a system and method for providing USB (universal serial bus) television programs, and in particular, for enabling television programs to be displayed on a computer display screen in combination with advertisements or other selected content.

Television programs have traditionally only been viewed through a television set, which is a device dedicated to the display of such programs. Although various hybrids of computers or Internet with television sets have been proposed, such as "Web TV" of Microsoft Corp., (Redmond, WA, USA) for example, no such hybrid has become particularly popular and/or widely available. At least one reason for this lack of popularity has been the requirement for hybrid devices, and/or cumbersome additions to television sets.

Recently, the Internet has become a very popular source of data for accessing with a computer, particularly with a Web browser. Millions of users worldwide are connected to the Internet through computers, both at work and at home. Similarly, watching television programs is also a very popular source of entertainment. Clearly, in spite of the lack of popularity of currently available combinations of computers and television sets, such a combination has great commercial and entertainment potential. A more useful combination could be easily added to a computer as an easily installed hardware device, since the computer offers extensive features and flexible for providing a user interface. Unfortunately, such a simple high-quality device, which is also easy to install and operate, is not readily available.

Furthermore, such a combination could enable advertising revenues to be obtained from the combination of viewing television programs and accessing data resources through the Internet, such as E-commerce Web sites for example. Such a combination would not rely upon any particular

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implementation of a hardware device for providing the television program content, as long as the device supports the display of a high quality image which is large, smooth and clear, and would enable advertisers to benefit from the combination of two popular, entertaining activities. Again, unfortunately such a combination is not available.

There is thus an unmet need for, and it would be useful to have, a hardware device which could be used to enable a computer to display television program content, as well as a combination of software GUI (graphical user interface) elements which would enable a user to both view television programs and surf through Web sites substantially simultaneously, while generating advertising revenues for the Internet service providers and other service providers on the World Wide Web.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages will be better understood from the following detailed description of a preferred embodiment of the invention with reference to the drawings, wherein:

FIG. 1 is a schematic block diagram of a USB-TV hardware according to the present invention;

FIG. 2 is a schematic block diagram of a system for combining a USB-TV hardware with a computer according to the present invention;

FIG. 3 is a flowchart of a method for presenting television program data through USB-TV hardware and the computer according to the present invention;

FIG. 4 is a flowchart of a method for enabling the user to select television programs according to the present invention; and

FIG. 5 is a schematic block diagram of an exemplary GUI according to the present invention.

SUMMARY OF THE INVENTION

The present invention is of a device, a method and a system for enabling

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television program content to be displayed through a computer. Furthermore, the present invention enables the user to select, record, display and manipulate television program content through the computer. In addition, the present invention enables the user to view television programs while examining data resources through the Internet, such as Web sites for example. A GUI (graphical user interface) is preferably presented to the user through a Web browser. Thus, the present invention enables two popular, entertaining activities, watching television programs and interacting with Web sites, to be combined.

According to the present invention, there is provided a device for enabling television program data to be displayed by a computer, the computer featuring a USB (universal serial bus), the device comprising: (a) a video signal input for receiving a television program video signal; (b) a tuner for receiving the television program video signal from the video signal input and for adjusting the video signal; (c) a video decoder for receiving the television program video signal from the tuner and for decoding the video signal; (d) a USB interface for converting the decoded video signal to form a USB signal; and (e) a USB plug for connecting to the USB of the computer, such that the computer receives the USB signal.

According to another embodiment of the present invention, there is provided a system for displaying a television program, the system comprising: (a) a computer for displaying the television program, the computer comprising: (i) a USB (universal serial bus) for receiving television program data; and (ii) a display connected to the USB for displaying the television program; and (b) a television device for receiving a television program signal and for converting the television program signal to the television program data, the television device comprising: (i) a video signal input for receiving the television program signal; (ii) a USB interface for converting the television program signal to form a USB signal; and (iii) a USB plug for connecting to the USB of the computer, such the computer receives the USB signal.

According to yet another embodiment of the present invention, there is

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provided a method for displaying television program data by a computer, the computer featuring a USB (universal serial bus), the method comprising the steps of: (a) receiving a television program video signal; (b) tuning the television program video signal to form a tuned signal; (c) decoding the tuned signal to form a decoded signal; (d) converting the decoded signal to form a USB signal; (e) transmitting the USB signal to the USB of the computer; and (f) displaying the USB signal by the computer to display the television program data.

According to still another embodiment of the present invention, there is provided a method for recording a television program video signal received by a computer, the television program video signal corresponding to a television program selected by a user, the method comprising the steps of: (a) selecting the television program by the user to form a selected television program; (b) entering the selected television program into the computer by the user; (c) determining a time period for recording the selected television program by the computer; (d) receiving the television program video signal by the computer at the time period; and (e) storing the television program video signal in a memory storage of the computer such that the television program video signal is recorded.

According to still another embodiment of the present invention, there is provided a method for displaying a television program in a first portion of a Web browser while displaying a second data resource in a second portion of the Web browser, the Web browser being displayed by a computer, the method comprising the steps of: (a) providing a Web browser with a plurality of display areas, each display area being substantially independent of other display areas; (b) receiving a television program video signal by the computer corresponding to the television; (c) displaying the television program video signal display area such that the first display area is the first portion of the Web browser; and (d) displaying the second data resource in a second display area, such that the second display area is the second portion of the Web browser.

Hereinafter, the term "Web browser" refers to any software program

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which can display text, graphics, or both, from Web pages on World Wide Web sites. Hereinafter, the term "Web page" refers to any document written in a mark-up language including, but not limited to, HTML (hypertext mark-up language) or VRML (virtual reality modeling language), dynamic HTML, XML (extended mark-up language) or related computer languages thereof, as well as to any collection of such documents reachable through one specific Internet address or at one specific World Wide Web site, or any document obtainable through a particular URL (Uniform Resource Locator). Hereinafter, the term "Web site" refers to at least one Web page, and preferably a plurality of Web pages, virtually connected to form a coherent group. Hereinafter, the term "Web server" refers to a computer or other electronic device which is capable of serving at least one Web page to a Web browser.

Hereinafter, the term "applet" refers to a self-contained software module written in an applet language such as Java or constructed as an ActiveX™ control. Hereinafter, the term "network" refers to a connection between any two computers which permits the transmission of data.

Hereinafter, the phrase "display a Web page" includes all actions necessary to render at least a portion of the information on the Web page available to the computer user. As such, the phrase includes, but is not limited to, the static visual display of static graphical information, the audible production of audio information, the animated visual display of animation and the visual display of video stream data.

Hereinafter, the terms "computer user" and "user" both refer to the person who operates the Web browser or other GUI interface and navigates through the system of the present invention by operating a computer.

Hereinafter, the term "computer" refers to a combination of a particular computer hardware system and a particular software operating system. Examples of such hardware systems include those with any type of suitable data processor. Hereinafter, the term "computer" includes, but is not limited to, personal computers (PC) having an operating system such as DOS, Windows™, OS/2™ or Linux; Macintosh™ computers; computers having

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JAVA™-OS as the operating system; and graphical workstations such as the computers of Sun Microsystems™ and Silicon Graphics™, and other computers having some version of the UNIX operating system such as AIX™ or SOLARIS™ of Sun Microsystems™; a PalmPilot™, a PilotPC™, or any other handheld device; or any other known and available operating system. Hereinafter, the term "Windows™" includes but is not limited to Windows95™, Windows 3.x™ in which "x" is an integer such as "1", Windows NT™, Windows98™, Windows CE™ and any upgraded versions of these operating systems by Microsoft Inc. (Seattle, Washington, USA).

For the present invention, a software application could be written in substantially any suitable programming language, which could easily be selected by one of ordinary skill in the art. The programming language chosen should be compatible with the computer by which the software application is executed, and in particularly with the operating system of that computer. Examples of suitable programming languages include, but are not limited to, C, C++ and Java. Furthermore, the functions of the present invention, when described as a series of steps for a method, could be implemented as a series of software instructions for being operated by a data processor, such that the present invention could be implemented as software, firmware or hardware, or a combination thereof.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is of a device, a method and a system for enabling television program content to be displayed through a computer. Furthermore, the present invention enables the user to select, record, display and manipulate television program content through the computer. In addition, the present invention enables the user to view television programs while examining data resources through the Internet and interacting with these resources, such as Web sites for example. A GUI (graphical user interface) is preferably presented to the user through a Web browser. Thus, the present invention

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enables two popular, entertaining activities, watching television programs and interacting with Web sites, to be combined.

In addition, the present invention features a method for enabling additional advertising revenues to be obtained, as well as for providing more focused, targeted advertising. In this method of the present invention, the television program data is displayed to the user through a Web browser as the GUI, such that the user is also able to examine Web pages substantially simultaneously. The attention and presence of the user while examining a particular Web page may therefore be maintained, possibly even with an increase of interest by the user in particular advertising information. Such maintained and even increased attention and interest is valuable for transmitting advertising information to the user, such that additional advertising revenues may be charged for enabling such a transmission. Thus, the method of the present invention also enables the effectiveness of the advertising to be increased, and hence enables additional advertising revenues to be charged.

The principles and operation of a device, a system and a method according to the present invention may be better understood with reference to the drawings and the accompanying description, it being understood that these drawings are given for illustrative purposes only and are not meant to be limiting.

Referring now to the drawings, Figure 1 is a schematic block diagram of an illustrative, exemplary USB-TV (USB television) hardware according to the present invention. A USB-TV hardware **100** is able to connect to a computer (not shown) through the USB (Universal Serial Bus; not shown) of the computer (see Figure 2 below). This connection enables the computer to be transformed into a television-like device, capable of displaying television programs received from a cable or antenna connection. The video data is displayed on the monitor or other display device of the computer, while the audio data is played through the speakers, sound card or other audio device of the computer (not shown). Thus, USB-TV hardware **100** transforms a computer into a device capable of displaying video and audio television

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signals, substantially without any additional modifications or changes to the computer hardware itself.

As shown in this exemplary configuration, USB-TV hardware **100** receives a video signal **112** as an input. Video signal **112** may be obtained as an RF video signal, for example from a television antenna, or alternatively may be obtained as a cable video signal, or alternatively by converting other signals such as television program signals which are received from a satellite, for example. Preferably, USB-TV hardware **100** also receives a radio signal **114** as an RF signal input. As shown, USB-TV hardware **100** then outputs decoded and compressed video, and optionally audio, data into a USB plug **170**. USB plug **170** is defined according to the standards described in the USB interface and bus standard (Universal Serial Bus standard version 1.0 or 1.1, by Compaq, IBM, Intel, Microsoft and others

The USB standard defines a serial bus capable of connecting to multiple devices. The USB bus has 4 lines, including two ground and power lines for supplying electrical power to the attached devices, and two lines for transmitting differential signals carrying the USB protocol and information. Because the USB bus has a limitation for the rate of data transmission which is significantly lower than the data rate of the video signal, the video signal is preferably be compressed before being transferred through the USB bus.

Within the e and illustrative configuration of USB-TV hardware **100** which is shown in Figure 1, the process of decoding and compressing the video, and optionally audio signals, is preferably performed as follows. Video signal **112** and optionally radio signal **114** are passed to a tuner block **110**. RF Video In signal **112** is also referred to as a "TV In" signal, and optionally and preferably is compliant with standards for such signals as the NTSC, PAL, or Secam standards. RF Radio In signal **114** is preferably an FM radiowave signal. For each separately of RF Video In signal **112** and RF Radio In signal **114**, the signal source may be obtained from a cable connection or alternatively, through an airwave connection to an antenna. Optionally and preferably, if USB-TV hardware **100** includes a suitable satellite signal

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converter (not shown), the signal source may also be obtained from a satellite feed. Similarly, if USB-TV hardware **100** includes another, different type of converter, other types of signal sources may optionally be used, such as a cable modem connection to an IP (Internet protocol) or other type of packet-switched network.

Once tuner **110** has received RF Video In signal **112** and optionally RF Radio In signal **114**, tuner **110** selects a channel and band for decoding RF Radio In signal **114**, as described in greater detail below. Tuner **110** then decodes the selected channel of the selected band of RF Radio In signal **114**, which is optionally and preferably in the format of a FM mono or stereo signal, or alternatively may be in any other standard audio signal format which is supported by tuner **110** to create an audio signal **116**.

Similarly, tuner **110** selects a channel and band for decoding RF Video In signal **112**, as described in greater detail below. Tuner **110** then decodes the selected channel of the selected band of RF Video In signal **112** to create a video composite signal **118**, which is an analog video signal of the selected channel. The sound signal from the selected video channel is also output as audio signal **116** from tuner **110**. Examples of suitable tuning devices include, but are not limited to, the FM1236/F tuner (in case of NTSC video), or the FM1216/I tuner (in case of PAL video), both made by Philips Ltd. (Netherlands).

Tuner **110** receives control information for adjusting the decoding and compressing processes for RF Video In signal **112** and optionally RF Radio In signal **114**, and in particular for selecting the channel and the band for decoding RF Video In signal **112** and optionally for RF Radio In signal **114** by decoding the I^2C bus signals The I^2C bus signals are generated by I^2C Controller block **180**, and are used by tuner **110** to separately select the band and channel for decoding RF Video In signal **112** and optionally RF Radio In signal **114**. I^2C Controller **180** also controls a video decoder **120**, as described in greater detail below.

Video decoder **120** decodes video composite signal **118** and produces a

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digital video YUV signal **122**, which is a standard format for a digital video signal. Video YUV signal **122** features three separate components, including one Luminance component and two separate Chrominance components, rather than a composite signal which features the Red, Green and Blue color signals of the video image . Video YUV signal **122** preferably complies with CCIR standards 601 and 605 for digital representation of a video signal. The I^2C bus signal is decoded by video decoder **120** to control the levels of brightness, contrast and saturation of video YUV signal **122**. An example of a suitable video decoder may be implemented by using the SA7111 integrated circuit (Philips, Netherlands).

Video YUV signal **122** and audio signal **116** are input to a compressor block **130**. Compressor **130** first scales the image resolution of video YUV signal **122** to a predetermined value controlled by a USB Interface **150**, which serves as an interface between the functionality of USB-TV hardware **100** and the output to the USB itself, USB plug **170**. Compressor **130** then preferably compresses video YUV signal **122** and audio signal **116**, and combines these two separate signals into a single signal. Alternatively but optionally, audio signal **116** may be output to an audio plug (not shown), which is then directly connected to the sound input plug of the host computer by using an external wires (not shown). Regardless of the implementation for inputting audio signal **116**, the compression of the signal or signals is required because the data rate for receiving data by USB plug **170** is lower than the full data rate of video YUV signal **122** and audio signal **116** after decoding. Compressor **130** uses memory block **140** as a buffer for holding the frames of video YUV signal **122** for the compression process.

The compression algorithm of compressor **130** is based upon the well-known spatial decorrelation methods with a temporal domain compression method. The latter compression method operates as follows. A video signal is composed of a sequence of images, called frames: A keyframe is a frame defined per predetermined number of frames, such as one frame per 15 frames. A keyframe is also called Intra-frame, while the intermediate frames of

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consecutive Intra-frames are called Inter-frames. In order to eliminate error propagation, the Intra-frames are not compressed by the spatial compression method. However, the Inter-frames are compressed according to such a compression method. Error propagation within Inter-frames is eliminated by usage of separate horizontal strips, wherein each strip is composed of a predetermined number of consecutive lines of the frame.

After compressor **130** has finished compressing video YUV signal **122** and audio signal **116**, USB Interface **150** receives the compressed video YUV signal **122** and audio signal **116** data, and converts this compressed data to the standard differential signals D+ and D-. In doing so, USB Interface **150** uses an additional memory **160** for buffering. Memory block **140** and additional memory **160** may optionally be implemented using the same physical memory device such as a memory chip, or as a memory device which is attached to compressor **130** and USB Interface **150**. USB Interface **150** preferably uses another memory block **165** to store and retrieved particular information for customizing the configuration of USB-TV hardware **100**, such as information concerning the host computer and so forth. Memory block **165** should preferably be of a non-volatile type, such as a flash memory or an EEPROM for example.

Data signals D+ and D- from USB Plug **170** are connected to USB Interface **150**. The GND and +5V lines from USB Plug **170** are connected to power supply **190**. Power supply **190** generates the appropriate voltages for all other blocks, except for USB Plug **170**.

USB Interface **150** preferably decodes the signals D+ and D- received from USB Plug **170**, into control signals which are output to I^2C Controller **180**, and which are also used to control the scaling of the compression of video YUV signal **122** and audio signal **116** inside compressor **130**.

I^2C Controller **180** encodes the control signals received from USB Interface **150** into I^2C bus signals and outputs the encoded control signals to tuner **110** and video decoder **120**. Compressor **130**, USB Interface **150** and I^2C Controller **180** may optionally be implemented by using the NT1003 integrated

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circuit (with no audio support) or the NT1004 integrated circuit, both made by Nogatech Inc., of Cupertino, California, USA, for example.

Figure 2 describes the host computer, shown here as a computer **200**, and the operation of the host computer with USB-TV hardware **100**. Computer **200** as shown is only intended as an optional, exemplary embodiment of a computer for operation with USB-TV hardware **100** according to the present invention, and is not intended to be limiting in any way. Furthermore, the components of computer **200** as shown in Figure 2 as functional features of computer **200**, which could be implemented in many different ways. The architecture of computer **200** as shown is based upon the PC (personal computer) architecture, which again is only for the purposes of description and is not intended to be limiting in any way.

Computer **200** features a CPU (Central Processing Unit) **210**. CPU **210** is shown as a schematic, functional component computer **200**. A typical but optional implementation of CPU **210** would include both the CPU itself and an attached memory, known as a "cache" (not shown), for rapid access and processing of software program commands and data. CPU **210** executes software programs which reside in the cache, loaded into a memory **215**, or at a hard disk **220**. It is understood that hard disk **220** could optionally be implemented as any type of permanent memory storage device, preferably a magnetic storage medium device of some type, more preferably featuring a disk controller unit, which provides data buffering and disk control. Memory **215** is also shown as a schematic block, and in a typical but optional implementation, features both volatile and non-volatile memory devices. CPU **210** typically runs an operating system as previously described.

Computer **200** receives the compressed output signal, including both video and audio data, from USB-TV hardware **100** of Figure 1. Computer **200** then decompresses the compressed output signal, and causes the video portion of the decompressed signal to be displayed through a display **205**. Display **205** is optionally but preferably implemented as a computer monitor or other display screen device which is operable by computer **200**. In addition,

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computer **200** controls the functions of USB-TV hardware **100** as the host computer for USB-TV hardware **100**.

The image and image layout of display **205** are controlled by a display driver **225**. CPU **210** typically writes the display driver image data and the commands for the representation of the image data by connecting to display driver **225** through a computer bus **212**.

A sound driver **230** drives a speaker system **235**. Speaker system **235** may optionally and preferably feature a left speaker and right speaker, and may also optionally feature additional speakers, such as a central sub-woofer speaker. CPU **210** typically writes the data to sound driver **230**, again through computer bus **212**. Sound driver **230** has also an external sound input (not shown). This external sound input may be used to receive audio data from tuner **110** of USB-TV hardware **100** (not shown, see Figure 1), into computer **200**, if audio input is not received by compressor **130** of USB-TV hardware **100** (not shown, see Figure 1).

CPU **210** is also in communication with a device I/F (Interface) **240** through computer bus **212**, which optionally and preferably connects to, and controls the actions of, peripherals such as a keyboard **245** and a mouse **250**. Other peripherals, such as a joystick (not shown), may optionally be implemented as well. In addition, CPU **210** is also preferably in communication with a USB I/F **260** through computer bus **212**. USB I/F **260** controls, transmits and receives data to and from USB devices which are connected through USB Plug **270**. USB I/F **260** also supplies power to such USB devices. Although USB-TV hardware **100** is specifically shown as being connected to USB Plug **270**, it is well understood that also other devices having a USB interface, such as an appropriate peripheral device such as a keyboard or mouse, for example, could optionally be connected to USB Plug **270**.

A network I/F **280** provides a connection to a network, more preferably the Internet, for computer **200**. The specific implementation of network I/F **280** depends upon the particular type of network connection. For example, network I/F **280** could optionally and preferably be a 56K Modem, ISDN card,

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DSL Modem, Ethernet card, or other suitable communication device, appropriate for providing a connection to a network such as the Internet. It should be noted that computer **200** may be connected to the computer network through an intermediary network connection, for example by connecting to an ISP (Internet Service Provider) through the PSTN (public switched telephone network) with a suitable telephony modem. The connection to the Internet would then be provided through the ISP.

The above-described components such as CPU **210** reside on computer bus **212**. CPU **210** frequently controls and manages data transfers over computer bus **212**, although some other devices, such as hard disk **220** may optionally control computer bus **212** for managing the data transfers. Power is supplied to the above-described components by a power supply (not shown), which preferably is located within computer **200** and supplies power to all components, including power supplied to USB Plug **270** for transfer to the USB devices.

Figure 3 is a flowchart of an optional but preferred embodiment of the operation of USB-TV hardware **100** in conjunction with computer **200**. USB-TV hardware **100** receives power from USB Plug **270**. CPU **210** preferably operates a software program which is stored in a non-volatile memory device connected to computer **200**, such as hard disk **220** or memory **215**, for example. This software program, which may also optionally be implemented as firmware or hardware for example, controls the operation of USB-TV hardware **100**.

In step 1, the user is presented with an interface, preferably a GUI (graphical user interface), which preferably includes a plurality of menus and controls such as buttons and sliders, by display **205**. In step 2, the user interacts with the elements of the GUI by using keyboard **245** and mouse **250**, and/or optionally some other type of pointing device and/or a touch-sensitive screen.

In step 3, CPU **210** monitors the interaction and issues the relevant command to USB-TV hardware **100**, through USB I/F **260** and USB Plug **270** to which USB-TV hardware **100** is attached. For example, if the user

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specifically selects a band and channel in step 2, the band and channel selection are directed by I^2C Controller **180** of USB-TV hardware **100** in communication with tuner **110**. Another example of a band and channel selection step which could be performed in step 2 is operating a scan through all the channels supported by USB-TV hardware **100**, then selecting an active channel. In addition, the On/Off commands are also controlled and implemented through I^2C Controller **180** of USB-TV hardware **100** in communication with tuner **110**.

Optionally and preferably, in step 4, the user enters information for automatic programming of one or more selected, active channels in a channel list. Optionally and more preferably, the GUI display is in communication with a standard Web browser software such as Internet Explorer™ (Microsoft Corp., USA), for entering information to computer **200** from a Web page and/or Web site, as described in greater detail with regard to Figure 4. In step 5, the user set the size of the television display window to be shown on display **205** of computer **200**.

Returning again to the functions of USB-TV hardware **100** in conjunction with computer **200**, USB-TV hardware **100** begins to receive the television signal feed of the selected channel, including at least video data, in step 6. In step 7, I^2C Controller **180** also directs the levels of brightness, contrast and saturation to video decoder **120**. Controller **180** prepares a scaling figure according to software instructions which are implemented by CPU **210**, and sent to USB-TV hardware **100**, where USB Interface **150** directly transfers this scaling figure as the scaling level of compressor **130**.

In subsequent steps, the data is decompressed and rebuilt into a sequence of video frames. If available, the data optionally includes audio data. These steps are performed as follows. In step 8, the compressed data from USB-TV hardware **100** is input through USB plug **270** to USB I/F **260**. The compressed data is then loaded to memory **215** in step 9. According to software instructions, CPU **210** then decompress the data into an image sequence, using memory **215** as a temporary buffer, and transfers the image sequence into display driver **225** in step 10. If available, optionally and preferably the audio

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data is transferred to sound driver **230** in step 11. Sound driver **230** optionally and preferably amplifies the audio data and outputs the signal to speaker system **235** in step 12. Alternatively, the audio data may be input to sound driver **230** through the external sound input in step 12.

The next step causes the frame sequence to be displayed on display **205**, by using display driver **225** in step 13. Optionally and preferably, in step 13, information received from the user through the GUI is used by display driver **225** to determine the placing of the frame sequence on display **205**. Alternatively and preferably, predetermined settings are used to determine the placing of the frame sequence.

The control and interaction of the user with the GUI is described in greater detail with regard to Figures 4 and 5. Figure 4 is a flowchart of an exemplary method for receiving information and controlling the functionality of USB-TV hardware **10** through a GUI, which is preferably implemented within the environment of a Web browser. Figure 5 is an exemplary block diagram of an illustrative GUI according to the present invention.

As shown in Figure 4, in step 1, the user can download Web pages which have a listing of television programs being transmitted through each channel into the Web browser. This listing is optionally and preferably selected to match the geographic location of the user by specifying the zip code or other address information for identifying the geographic location. In addition, preferably the listing includes information which is received from the TV-content supplier of the user, which is typically a cable or a satellite company. It should be understood that the listing may be a part of a more comprehensive page also featuring data other than the listing. An example would be a personal start page of a distinct customer of a portal such as Yahoo (the major web address is http://www.yahoo.com), which provides personalized data such as the local weather, local news, and local TV listings. In step 2, the user examines the listing to determine the channel and time to watch.

In step 3, the user enters one or more commands through the GUI in order to record the time of the chosen television show and the appropriate band

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and channel information. For example, in a more automated method, the user could select a particular television program, and the relevant time and channel could then optionally be automatically determined. Optionally, in step 4 the information is recorded in some memory and/or data storage component of computer **200**, for example in memory **215** or alternatively in hard disk **220**. In step 5, USB-TV hardware **100** is automatically activated according to the television show times which have been optionally and preferably recorded by the user in advance. Optionally and more preferably, the television program could be specified according to a special code for automatically and accurately activating USB-TV hardware **100**, even if the television program itself does not begin transmission at exactly the specified time. Alternatively and preferably, the user could specifically select a television show as it begins transmission.

In step 6, the compressed data is optionally loaded into hard disk **220** rather than memory **215**. In a separate process, in step 7, CPU **210** decompresses the data into an image sequence according to software instructions, by using memory **215** as a temporary buffer. In step 8, CPU **210** then transfers the image sequence into display driver **225**. Such a combined process enables time delays to be optionally and preferably inserted between the step of loading of the compressed data, which is actually the original show time of the television program, and the step of showing of the television program on computer display **205** in step 9. In that case, in order for the process to have synchronized image and sound data, the configuration with the direct link from USB-TV hardware **100** to sound driver **230** is not allowed. The sound data has to be carried through USB-TV plug **270** in step 10, and is processed in a separate process as previously described for the image data with the same or substantially similar time delays.

Such a process for enabling time delays is most preferably implemented with compressed data from USB-TV hardware **100** as input data to computer **200**. Otherwise, if the data is not compressed, computer **200** may not be able to handle the much larger data rates, and the amount of available memory as a temporary buffer will only be sufficient for much shorter and/or fewer time

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delays. Such a preferred implementation of a time delay enables many optional but preferred features to be offered.

For example, the user may optionally and preferably operate a "pause procedure", in which the television program image sequence continues to be loaded onto hard disk **220**, while the displayed image sequence is held frozen, as shown in step 11. When the user wishes to terminate the "pause", the program image sequence is decompressed and shown on display **205** in step 12, as described above. The user may then either continue watching the television program images in sequence, or alternatively may "fast-forward" through portions of the television program, for example during the display of advertisements, to minimize the time lag, in step 13. The "fast-forward" is preferably performed by moving past a pre-determined amount of data related a portion of the image sequence. Alternatively, the "fast-forward" feature may be performed by moving beyond specific features of the television program, such as the display of an advertisement, selected according to content analysis, for example. Alternatively, if the timing and length of certain features such as commercials are known in advance, for example from information distributed by the broadcaster of the television program, the "fast-forward" may be automatically determined.

Optionally and more preferably, a combination of the automatic activation of USB-TV hardware **100** with the introduction of time delays into the display of the image sequence data may be performed. For example, the user could optionally and most preferably determine a sequence of television programs to record and store on computer **200**, for viewing at a later time.

In a further optional and exemplary enhancement of the method of the present invention, the user can optionally and most preferably activate automatic selection and recording of television programs, according to the interests of the user. These television programs may be selected according to descriptions which are given for example in the above listings found at the Internet sites. For example, the user may optionally decide to record all shows related to basketball for later viewing, thereby practically creating a dedicated

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"basketball channel". In a further enhancement, the user can remotely activate recording of a television program and/or enter specific television program recording times, through the Internet using Internet I/F **280**. An example application would be to activate the recording of a favorite television program, on the home computer from a computer at the workplace of the user.

As another preferred embodiment of the present invention, described with regard to Figure 5 below, the frame sequence of the video data may be displayed in a particular portion of the Web browser, thereby enabling the user to watch television programs while browsing through other Web pages and other available information through the Internet, without interruption.

Figure 5 is a schematic block diagram of an exemplary GUI according to the present invention, incorporated within a Web browser **300**, for display on display **205** of computer **200**, in which the images from the video image sequence resides in a dedicated frame or sub-window of Web browser **300**. Although the following description centers upon the operation of Web browser **300** as an Internet Explorer™ software program(Microsoft Corp., USA), one of ordinary skill in the art could easily implement the present invention with any conventional Web browser software program as Web browser **300**. Web browser **300** features a menu bar **310** carrying the folding command menus, a button bar **315** featuring buttons for selected operations related to browsing through Web pages, and an address bar **320** for input and/or display of the current Web page presented in a browsing frame **325** of Web browser **300**. Browsing frame **325** is a portion of the display window, and/or a sub-window, of Web browser **300**.

Optionally and preferably, attached at the right side of browsing frame **325** is a scrolling bar **328**, with a tab (not shown) for scrolling through the Web page if its length is larger then the available length of browsing frame **325**. If the length of the Web page is less then the available length of browsing frame **325**, scrolling bar **328** is optionally and preferably not presented. Similarly, if the width of the Web page is larger then the width of browsing frame **325**, a horizontal scrolling bar is used (not shown), attached to the bottom of browsing

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frame **325**. These scrolling bars enable the entire content of the Web page to be sequentially viewed, even while the available area for the display of the Web page in Web browser **300** on display **205** is too small.

Web browser **300** optionally and more preferably features a status bar **330** for showing the loading status of the loaded Web page and the status of the Internet connection. The user may separately chose whether to display or hide button bar **315**, address bar **320**, and status bar **330**, through the folding View menu in menu bar **300**.

An illustrative Web-page displayed in browsing frame **325** optionally features a Web page header **332** for describing the Web page, Web page content **334** for carrying the actual content of the Web page, and optionally at least one banner, of which two are shown for the sake of illustration, banners **336** and **338** for displaying advertisements and/or information. A banner may simply feature textual and/or graphical data, but typically upon clicking or otherwise indicating a banner, for example with mouse **250** (not shown), a hyper-text link or URL is activated. Next, another Web browser **300**, and/or another browsing frame **325** is invoked for displaying additional information related to the banner subject. Alternatively, the address in address bar **320** is changed and the relevant Web page is loaded into browser frame **325**.

Banner advertisements, such as banners **336** and **338**, are important for receiving revenues from Internet advertising. The Web page provider may optionally receive a pre-determined amount of money for each "click" or user indication. As another option, a pre-determined part of the money charged for a purchase performed after a "click", for example from an e-commerce Web site, may be paid to the Web page provider.

The left frame of Web browser **300** is an explorer bar **340**, featuring a USB-TV image window **350** for displaying the image sequence of the video data from the television program. Explorer bar **340** may be alternatively located in the bottom of Web browser **300**. Explorer bar **340** may be minimized to a thin bar at the bottom of the display screen. The Explorer bar is a standard feature of the Internet Explorer™ Web browser (Microsoft Corp., USA),

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available for customization by using a supplied SDK (System Development Kit).

The content of Explorer bar **340** may optionally include anything which can be presented by Web browser **300**. Preferably, in the system and method of the present invention, USB-TV (television programs obtained through USB TV hardware **100**) is an option presented through menu bar **310**. The user, for example by using mouse **250**, may manipulate the border between browsing frame **325** and Explorer bar **340** to view the image data in a USB-TV image window **350**.

Although reference is made to USB-TV hardware **100** for the purposes of description, it is understood that these methods could easily be applied to television signal data from substantially any source by one of ordinary skill in the art. For example, the television signal data could be input into the computer from sources which include, but are not limited to, cable, air (antenna) and satellite signals.

Preferably, a plurality of USB-TV controls **355** is provided to manage and control the content of USB-TV image window **350**, optionally and more preferably composed of GUI elements such as various menus and controls. Alternatively or additionally, the controls or part of them, may be located elsewhere in Explorer bar **340**, or in another portion of Web browser **300**, in browsing frame **325**, and/or represented by an icon for example.

For example, the On/Off control button for USB-TV hardware **100** (not shown) may be located at buttons bar **315**, and the levels of brightness and contrast may be controlled from menu bar **310**. In another example, the On/Off button can be as part of the Web page displayed by browsing frame **325**. In yet another example, the On/Off control button may be part of a personalized home page or other specialized Web page, as previously described.

According to a particularly preferred embodiment of the present invention, a USB-TV banner **360** is displayed by Web browser **300**. USB-TV banner **360** has content which is preferably related to the content of the television program currently on display in USB-TV image **350**. More

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preferably, USB-TV banner **360** are input to the browser as part of USB-TV image **350**, by combining the content of USB-TV banner **360** with the lower portion of the image sequence. Similar to other banners, upon a mouse-click or other user indication, the appropriate link (if present) from USB-TV banner **360** is activated. Thus, the content of USB-TV banner **360** is optionally and most preferably controlled along with the content of the television program image data.

Such content may even be restricted, such that the television program broadcaster must enter a password or a code in order to write USB-TV banner **360** onto USB-TV image **350**, such that ownership of a portion of the screen-space is granted in terms of advertising.

Other combinations and/or configurations, in any meaningful physical arrangement, of the various elements shown in Figure 5 may be optionally performed. For example, USB-TV banner **360** may optionally fill all of the space available in Explorer bar **340** around USB-TV image **350** and controls **355**. Furthermore, USB-TV banner **360** may also be optionally implemented as a simple display of text and/or graphics, with no hyper-text link for example. In addition, optionally and preferably, any of banners **370**, **375**, **380** and/or **385** could be used to carry the content of banners **336** and/or **338**, for example if the user is examining a Web page which does not feature either or both of banners **336** and/or **338**, thereby maintaining the presence and attention of the user at the content of banners **336** and/or **338**.

This embodiment of the present invention permits the user to combine surfing through Web sites with viewing television programs. By supplying USB-TV image **350** in a separate Explorer bar **340**, the user can still browse while the presence of the ISP (Internet Service Provider) and/or another Web site and/or commercial service provider is maintained in Explorer bar **340**. For example, advertisements, which may previously have been presented in the Web page of a commercial service provider, are now optionally and preferably presented in Explorer bar **340**, thereby maintaining the presence of the advertisements even though the user is browsing through other Web sites. The

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presence of these advertisements may be even maintained when minimizing Explorer bar **340** to a thin bar in the bottom of the display screen.

In combination with USB-TV banner **360**, which provides reserved advertising space, and banners 370, 375, 380 and 385, a business method may be used to provide advertising and thereby to obtain advertising revenues, regardless of the particular implementation for delivering the television program content to computer **200** (not shown). Although clearly such a business method could be implemented with USB-TV hardware **100**, the method is not restricted to such an implementation. Instead, television program content from substantially any source can be substantially seamlessly integrated with advertisements and displayed by computer **200**, while optionally still enabling the user to view content related to Web pages or other Internet data resource, for example. Furthermore, such a combination enables users to perform both interesting activities simultaneously, such that the computer becomes a complete entertainment environment. According to the preferred embodiment of the present invention, the display of the television program does not interfere with the display of the Web page, since preferably two or more separate windows and/or sub-windows are displayed through the Web browser, including at least one separate window and/or sub-window for the television program content, and at least one separate window and/or sub-window for the Web page. Such combined viewing also enables the attention of the user toward advertising content to be maintained, even as the user switches through different television programs and/or Web pages, thereby increasing the effectiveness of the advertising and in turn, potentially increasing the advertising revenues which can be obtained from such advertising.

As a preferred embodiment of the present invention, since the user is known to be watching a television program, rather then quickly examining a plurality of different Web pages, as in the browsing frame **325**, advertisements of longer duration and/or serial advertisements may be shown in any banner space in Explorer bar **330**. Since the attention of the user is maintained toward

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such banner space, given the proximity of the banner space to the display of the television program content, the displayed advertisement may advantageously increase the total amount of transmitted advertising information. Such advertisements may be optionally and preferably targeted to each user through the combination of viewing Web pages while watching television programming content. The preferences of the user are most preferably analyzed by monitoring the viewing choices of television programming, and by monitoring the browsing habits of the user, in order to provide targeted advertising. USB-TV banner **360** could be implemented such that the displayed advertising content matches these preferences. In a further enhancement, browsing frame **325** may be optionally and more preferably used to automatically present the Web pages activated by the links from USB-TV banner **360** in Explorer bar **340**.

According to another preferred embodiment of the present invention, an advertisement could optionally and preferably be inserted directly into USB-TV image **350**, by driving the advertisement data, such as text, graphics, video or any combination thereof, to the display driver directly, rather than using Web browser **300**. According to this embodiment, a connection to the Internet would not even be necessary in order to display the advertisement with the television program data.

According to yet another preferred aspect of the present invention, the operation of USB-TV hardware **100** is controlled according to authorization information stored in computer **200**. For example, by using a specific coding mechanism, USB-TV hardware **100** may be optionally activated only when installed on a specified computer. This arrangement is suitable, for example, for configurations in which the user would receive a bundled computer with USB-TV hardware **100** and a connection to an ISP. Such a configuration may enable the combination to be offered at a reduced price, since the manufacturer or other provider could then obtain revenues from advertisements.

Preferably, a connection factor would be stored in a non-volatile memory 165 of USB-TV hardware **100**, such that the connection factor would

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be used to determine if USB-TV hardware **100** is connected to the particular computer. In addition, a comparison connection factor would be stored in the particular computer. The connection factor could then be compared to the comparison connection factor to form a comparison, such that USB-TV hardware **100** would determine whether to receive a television program according to the comparison.

Similarly, a parent or guardian of a minor could restrict access to television programs, such as those with violence or other harmful features. The parent or guardian could define restrictions to permitted viewing through USB-TV hardware **100** with the help of program listings, and those restrictions would then be stored, preferably in non-volatile memory **165** and/or other permanent storage device, such that even if the minor attempts to install USB-TV hardware **100** on another computer, the programmed restrictions would still block the undesirable television programming. The content of the television program could be controlled with a controlling factor, such that for example the parent or guardian could block and/or permit certain television programs by name, by an independent rating of the television program, or even according to a scan of the content of the television program as the content is received.

It will be appreciated that the above descriptions are intended only to serve as examples, and that many other embodiments are possible within the spirit and the scope of the present invention.

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WHAT IS CLAIMED IS:

1. A device for enabling television program data to be displayed by a computer, the computer featuring a USB (universal serial bus), the device comprising:

(a) a video signal input for receiving a television program video signal;

(b) a tuner for receiving said television program video signal from said video signal input and for adjusting said video signal;

(c) a video decoder for receiving said television program video signal from said tuner and for decoding said video signal to form a decoded video signal;

(d) a USB interface for converting said decoded video signal to form a USB signal; and

(e) a USB plug for connecting to the USB of the computer, such that the computer receives said USB signal.

2. The device of claim 1, wherein said television program video signal is an RF video signal.

3. The device of claim 1, wherein said television program video signal is a cable video signal.

4. The device of claim 1, wherein said television program video signal is a video signal.

5. The device of claim 1, further comprising:

(f) an audio signal output for outputting the audio signal of the input television program video signal.

6. The device of claim 1,2,3, wherein said tuner adjusts said

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television program video signal by selecting a channel and a band for decoding said television program video signal.

7. The device of claim 6, further comprising:

(g) a controller for determining said channel and said band for decoding said television program video signal, and for sending control information to said tuner for selecting said channel and said band.

8. The device of claim 7, wherein said video decoder decodes said television program video signal according to said channel and said band to form said decoded video signal, and wherein said device further comprises:

(h) a compressor for compressing said decoded video signal to produce a compressed video signal, said compressed video signal being passed to said USB interface.

9. The device of claim 8, wherein said compressor scales said decoded video signal according to a predetermined resolution factor substantially before compressing said decoded video signal.

10. The device of claim 9, wherein said tuner selects a channel and a band for decoding said audio signal and wherein said video decoder further decodes said audio signal according to said channel and said band to form a decoded audio signal and wherein said compressor combines said decoded video signal and said decoded audio signal to form a single signal for passing to said USB interface.

11. The device of claim 9, wherein said compressor compresses said decoded video signal at least partially according to a spatial decorrelation method featuring temporal domain compression.

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12. A system for displaying a television pro, the system comprising:

(a) a computer for displaying the television program, said computer comprising:

(i) a USB (universal serial bus) for receiving television program data; and

(ii) a display for receiving said television program data from said USB and for displaying the television program; and

(b) a television device for receiving a television program signal and for converting said television program signal to said television program data, said television device comprising:

(i) a video signal input for receiving said television program signal;

(ii) a USB interface for converting said program signal to form a signal; and

(iii) a USB plug for connecting to said USB of said computer, such said computer receives said USB signal.

13. The system of claim 12, wherein said television device further comprises:

(iv) a tuner for receiving said television program video signal from said video signal input and for adjusting said video signal; and

(v) a video decoder for receiving said television program video signal from said tuner and for decoding said video signal to form a decoded video signal, such that said decoded video signal is passed to said USB interface.

14. The system of claim 13, wherein said television program video signal is an RF video signal.

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15. The system of claim 12, wherein said television program video signal is a cable video signal.

16. The system of claim 12, wherein said television program video signal is a satellite video signal.

17. The system of claim 13, wherein said tuner adjusts said television program video signal by selecting a channel and a band for decoding said television program video signal.

18. The system of claim 17, wherein said television device further comprises:

(vii) a controller for determining said channel and said band for decoding said television program video signal, and for sending control information to said tuner for selecting said channel and said band.

19. The system of claim 18, wherein said video decoder decodes said television program video signal according to said channel and said band to form said decoded video signal, and wherein said device further comprises:

(h) a compressor for compressing said decoded video signal to produce a compressed video signal, said compressed video signal being passed to said USB interface.

20. The system of claim 19, wherein said compressor scales said decoded video signal according to a predetermined resolution factor substantially before compressing said decoded video signal.

21. The system of claim 20, wherein said television device further comprises:

(viii) a compressor for compressing said decoded video signal to

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produce a compressed video signal, said compressed video signal being passed to said USB interface.

22. The system of claim 21, wherein said television device further comprises:

(vi) an audio signal input for receiving an audio signal; and

wherein said tuner selects a channel and a band for decoding said audio signal and wherein said video decoder further decodes said audio signal according to said channel and said band to form a decoded audio signal and wherein said compressor combines said decoded video signal and said decoded audio signal to form a single signal for passing to said USB interface.

23. The system of claim 21, wherein said compressor compresses said decoded video signal at least partially according to a spatial decorrelation method featuring a temporal domain method for compression.

24. The system of claim 23, wherein said computer further comprises:

(iii) a display driver for receiving said converted video signal and for causing said display to display the television program

25. A method for displaying television program data by a computer to a user, the computer featuring a USB (universal serial bus), the method comprising the steps of:

(a) receiving a television program video signal;

(b) tuning said television program video signal to form a tuned signal;

(c) decoding said tuned signal to form a decoded signal;

(d) converting said decoded signal to form a USB signal;

(e) transmitting said USB signal to the USB of the computer; and

(f) displaying said USB signal by the computer to display the

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television program data.

26. The method of claim 25, wherein step (c) further comprises the step of:

(i) compressing said decoded signal to form a compressed signal, said compressed signal being converted to form said USB signal.

27. The method of claim 26, wherein step (e) further comprises the step of recording said USB signal by the computer to form a recorded USB signal;

and wherein step (f) further comprises the step of:

(i) reading said recorded USB signal to display said USB signal.

28. The method of claim 27, wherein step (i) further comprises the steps of:

(1) starting a process of displaying said recorded USB signal;

(2) stopping said process for a period of time; and

(3) resuming said process after said period of time has elapsed.

29. The method of claim 28, wherein step (2) further comprises the steps of:

(A) continuing to read said recorded USB signal while not displaying said recorded USB signal; and

(B) displaying said recorded USB signal.

30. The method of claim 27, wherein recording said USB signal further comprises the steps of:

(1) receiving a description of at least one television program, said description including an indicator for a time period for receiving said television program video signal;

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(2) selecting at least one television program according to said description; and

(3) recording said USB signal at said time period indicated by said indicator.

31. The method of claim 30, wherein step (1) is performed when the user is located at a remote location from the computer.

32. A method for recording a television program video signal received by a computer, the television program video signal corresponding to a television program selected by a user, the method comprising the steps of:

(a) selecting the television program by the user to form a selected television program when the user is located at a remote location from the computer;

(b) entering said selected television program into the computer by the user;

(c) determining a time period for recording said selected television program by the computer;

(d) receiving the television program video signal by the computer at said time period; and

(e) storing the television program video signal in a memory storage of the computer such that the television program video signal is recorded.

33. The method of claim 32, wherein step (a) further comprises the steps of:

(i) providing a computer connection of the computer to a network;

(ii) providing a user computer and a user connection of said user computer to said network;

(iii) downloading a listing of a plurality of television programs to said

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user computer through said network;

(iv) selecting the television program by the user from said listing of said plurality of television programs to form a selected television program; and

(v) transmitting information about said selected television program to the computer for recording said selected television program.

34. The method of claim 32, wherein step (a) comprises the steps of:

(i) providing a connection of the computer to a network;

(ii) downloading a listing of a plurality of television programs to the computer through said network; and

(iii) selecting the television program by the user from said listing of said plurality of television programs.

35. The method of claim 34, wherein step (b) is automatically performed upon selection of the television program by the user.

36. The method of claim 35, wherein step (c) further comprises the step of:

(i) determining said time period according to said listing of said plurality of television programs, such that the computer automatically receives information about said time period.

37. The method of claim 36, wherein said time period is determined according to a specific time for starting to broadcast the television program.

38. The method of claim 36, wherein said time period is determined according to a signal received by the computer to begin recording.

39. The method of claim 36, further comprising the steps of:

(f) requesting the stored television program video signal by the user;

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and

(g) displaying the stored television program video signal to the user from said memory storage of the computer.

40. The method of claim 39, wherein step (g) further comprises the step of requesting by the user that a portion of the stored television program video signal is not displayed for a "fast forward" procedure.

41. The method of claim 32, further comprising the steps of:

(f) starting a process of displaying the stored television program video signal;

(g) stopping said process for a period of time; and

(h) resuming said process after said period of time has elapsed.

42. The method of claim 41, wherein step (g) further comprises the steps of:

(A) continuing to read the stored television program video signal while not displaying the stored television program video signal.

43. The method of claim 42, wherein the computer features a USB (universal serial bus), such that the television program video signal is received through said USB in step (d).

44. The method of claim 43, wherein step (d) further comprises the steps of:

(i) tuning the television program video signal to form a tuned signal;

(ii) decoding said tuned signal to form a decoded signal;

(iii) converting said decoded signal to form a USB signal; and

(iv) transmitting said USB signal to said USB of the computer.

45. The method of claim 42, wherein the television video program

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signal is received by the computer from television signal source selected from the group consisting of airwaves, cable and satellite.

46. A method for recording a television program video signal received by a computer, the television program video signal corresponding to a television program selected by a user, the method comprising the steps of:

(a) selecting the television program by the user to form a selected television program;

(b) entering said selected television program into the computer by the user;

(c) determining a time period for recording said selected television program by the computer;

(d) receiving the television program video signal by the computer at said time period;

(e) storing the television program video signal in a memory storage of the computer such that the television program video signal is recorded;

(f) starting a process of displaying the stored television program video signal;

(g) stopping said process for a period of time; and

(h) resuming said process after said period of time has elapsed.

47. The method of claim 46, wherein step (g) further comprises the steps of:

(A) continuing to read the stored television program video signal while not displaying the stored television program video signal.

48. The method of claim 47, wherein the computer features a USB (universal serial bus), such that the television program video signal is received through said USB in step (d).

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49. The method of claim 48, wherein step (d) further comprises the steps of:

(i) tuning the television program video signal to form a tuned signal;

(ii) decoding said tuned signal to form a decoded signal;

(iii) converting said decoded signal to form a USB signal; and

(iv) transmitting said USB signal to said USB of the computer.

50. The method of claim 46, wherein the television video program signal is received by the computer from television signal source selected from the group consisting of airwaves, cable and satellite.

51. A method for displaying a television program to a user in a first portion of a Web browser while displaying a second data resource in a second portion of the Web browser, the Web browser being displayed by a computer, the method comprising the steps of:

(a) providing a Web browser with a plurality of display areas, each display area being substantially independent of other display areas;

(b) receiving a television program video signal by the computer corresponding to the television program;

(c) displaying said television program video signal in a first display area such that said first display area is the first portion of the Web browser; and

(d) displaying the second data resource in a second display area, such that said second display area is the second portion of the Web browser.

56. The method of claim 54, wherein the second data resource is a Web page.

52. The method of claim 51, further comprising the step of:

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(e) changing said second data resource while maintaining a display of said television program video signal in said first display area.

53. The method of claim 52, wherein said first display area further comprises a banner display area, wherein said banner display area displays at least one of text and graphics.

54. The method of claim 53, further comprising the step of:

(f) displaying an advertisement in said banner display area.

55. The method of claim 54, wherein a content of said advertisement is at least partially selected according to a content of said television program video signal.

57. The method of claim 56, wherein said content of said advertisement is also at least partially selected according to a content of said Web page.

58. The method of claim 56, wherein said advertisement is first displayed on said Web page and is only displayed on said banner display area if the user changes said display of said Web page.

59. The method of claim 54 wherein said advertisement features a plurality of content segments, each of said content segments including at least one of text and graphics, and each of said content segments being sequentially displayed in said banner display area.

60. The method of claim 59, wherein the user is viewing the television program and a period of time for displaying said plurality of content segments is proportional to a period of time for viewing the television program by the user.

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61. The method of claim 54, further comprising the step of:

(f) displaying an advertisement in said first display area with said television program video signal.

62. A method for controlling a television program video signal received by a computer, the television program video signal corresponding to a television program selected by a user, the method comprising the steps of:

(a) selecting at least one controlling factor for determining a content of the television program video signal;

(b) receiving the television program video signal by the computer;

(c) comparing the television program video signal to said at least one controlling factor to form a comparison; and

(d) determining whether to permit the television program video signal to be displayed by the user.

63. The method of claim 62, wherein step (b) is performed with a television reception device connected to the computer, said television reception device comprising:

(i) a video signal input for receiving said television program signal;

(ii) a USB interface for converting said television program signal to form a USB signal; and

(iii) a USB plug for connecting to said USB of said computer, such said computer receives said USB signal.

64. The method of claim 63, wherein step (a) further comprises the step of storing said at least one controlling factor in said television reception device.

65. A method for controlling a television device connected to a particular computer, the television device receiving a television program video

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signal corresponding to a television program selected by a user, the method comprising the steps of:

(a) storing a connection factor in a non-volatile memory of the television device, said connection device for determining if the television device is connected to the particular computer;

(b) storing a comparison connection factor in the particular computer;

(c) receiving said comparison connection factor from the particular computer;

(d) comparing said comparison connection factor to said connection factor to form a comparison; and

(e) determining whether to permit the television program video signal to be displayed by the user according to said comparison.

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FIG. 1

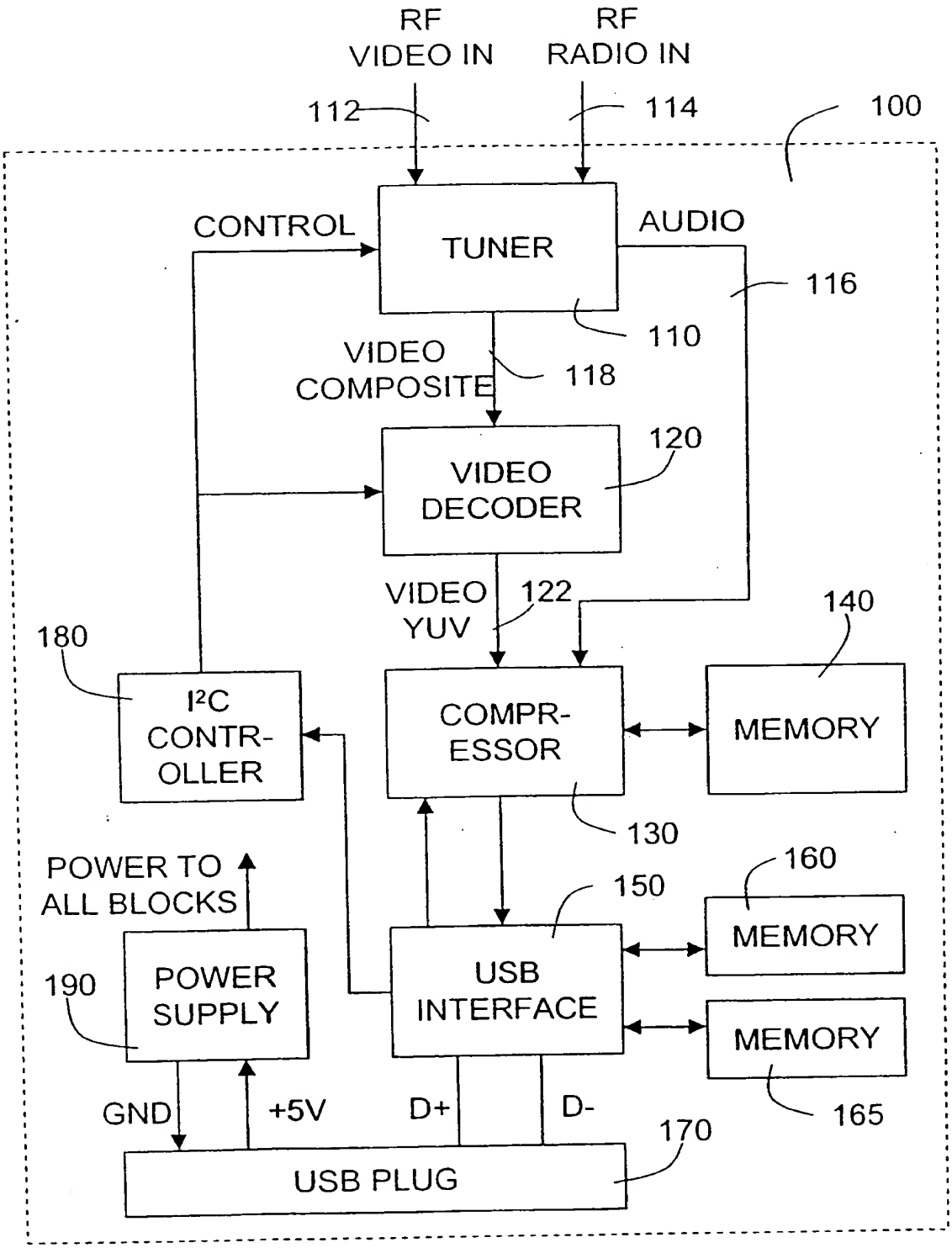

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FIG. 2

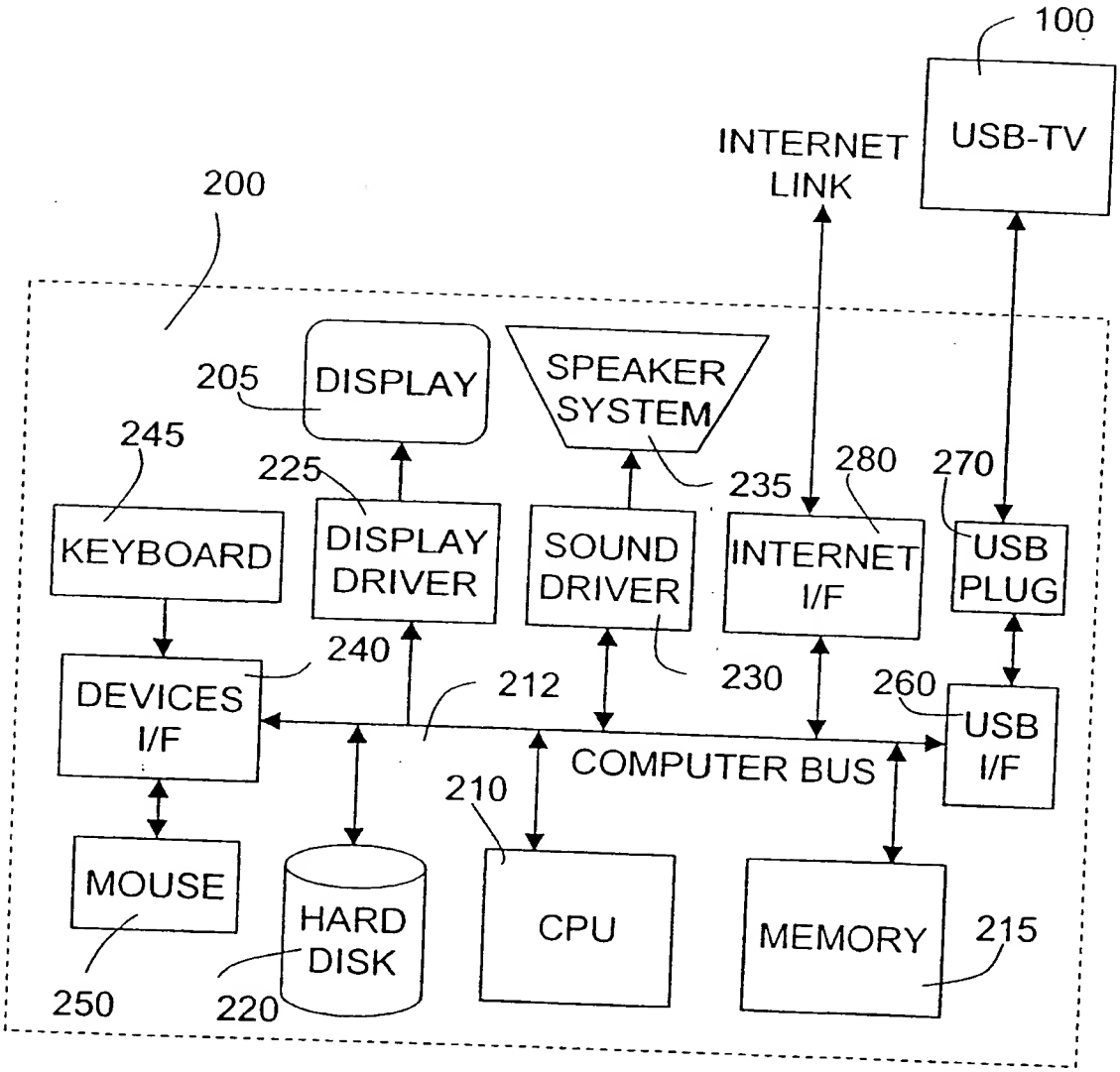

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Figure 3

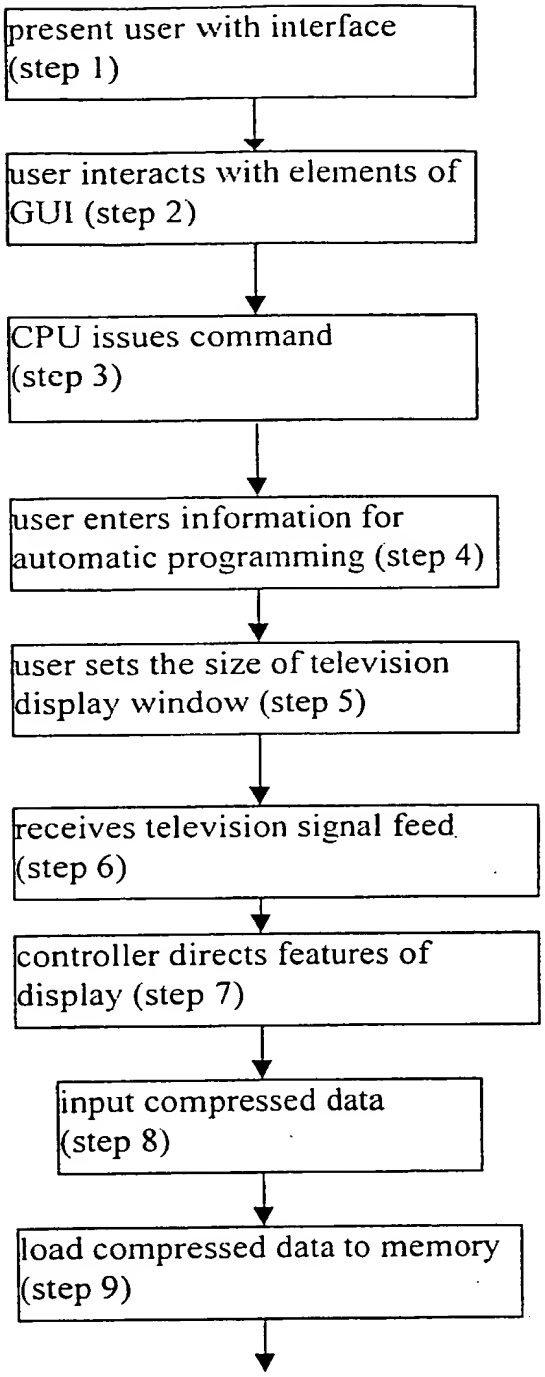

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Figure 3 (con't)

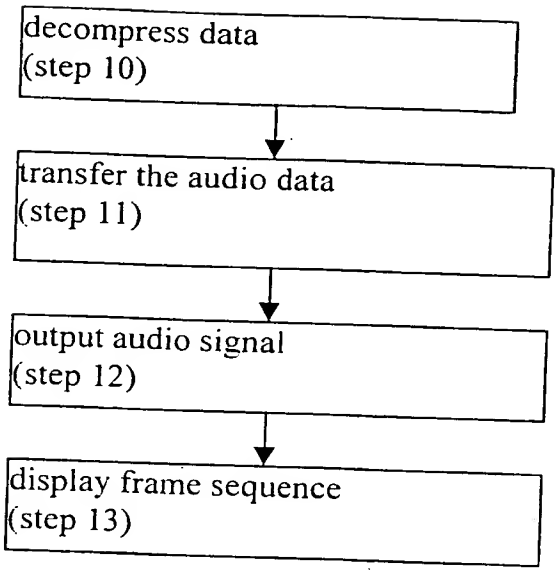

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Figure 4

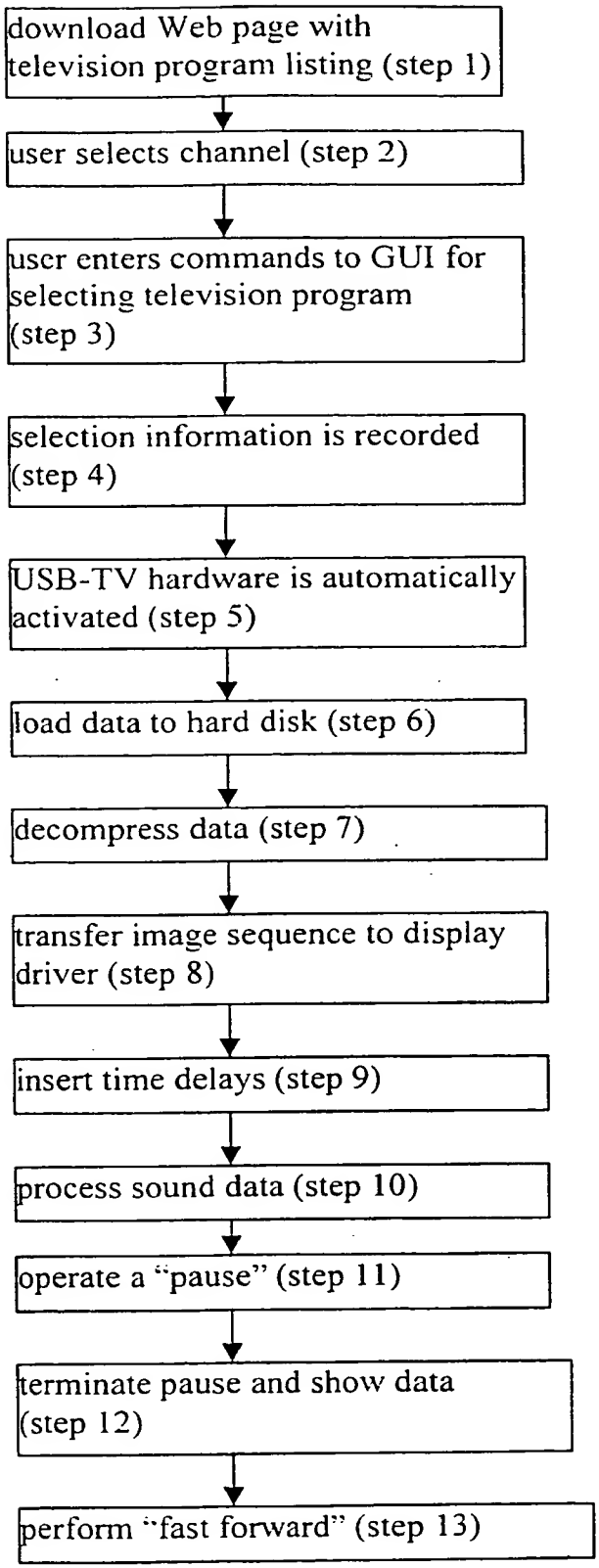
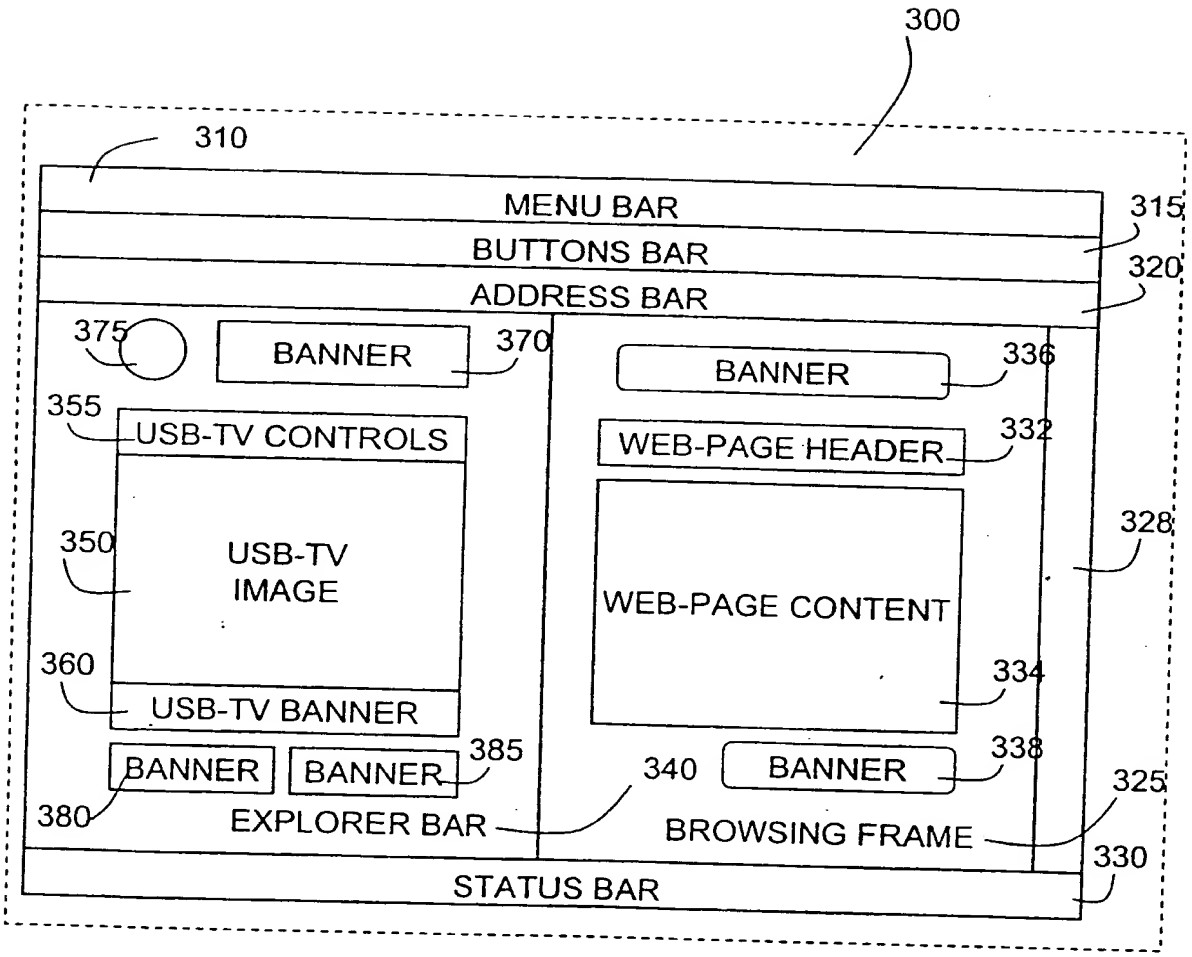

download Web page with television program listing (step 1)
user selects channel (step 2)
user enters commands to GUI for selecting television program (step 3)
selection information is recorded (step 4)
USB-TV hardware is automatically activated (step 5)
load data to hard disk (step 6)
decompress data (step 7)
transfer image sequence to display driver (step 8)
insert time delays (step 9)
process sound data (step 10)
operate a "pause" (step 11)
terminate pause and show data (step 12)
perform "fast forward" (step 13)

FIG. 5



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/20387

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) :H04N 7/01, 7/173, 7/16, 7/18, 5/445
US CL :725/28, 32, 42, 43, 49, 80, 100, 110, 133, 134; 348/443, 448
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : Please See Extra Sheet.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,787,259 A (HAROUN et al) 28 July 1998, see whole document.	1-65
Y	US 5,797,028 A (GULICK et al) 18 August 1998, see whole document.	1-65
Y	US 5,850,218 A (LAJOIE et al) 15 December 1998, see whole document.	1-61
Y	US 5,940,073 A (KLOSTERMAN et al) 17 August 1999, see whole document.	32-61

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
01 DECEMBER 2000

Date of mailing of the international search report
04 JAN 2001

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/20387

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,774,666 A (PORTUESI et al) 30 June 1998, see whole document.	51-61
Y	US 5,818,441 A (THROCKMORTON et al) 06 October 1998, see whole document.	51-61
Y	US 5,828,839 A (MONCREIFF) 27 October 1998, see whole document.	51-61
Y	US 5,929,849 A (KIKINIS) 27 July 1999, see whole documer.	51-61
Y	US 5,629,733 A (YOUMAN et al) 13 May 1997, see whole document.	62-65
Y	US 5,828,402 A (COLLINGS) 27 October 1998, see whole document.	62-65

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/20387

B. FIELDS SEARCHED
Minimum documentation searched
Classification System: U.S.

725/25, 28, 32, 39, 40, 42, 43, 48, 49, 74, 78, 80, 85, 86, 100, 109, 110, 131, 133, 134; 348/441, 443, 445, 448; 709/217, 218, 219

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